Claims

1.   A method for controlling a cell change in a service network, in which method
- a terminal performs neighbour cell measurements for a cell change,
- the network makes a cell change decision based on said measurement results, net-
5   work load and the terminal's service needs (31, 41), and
- the network sends to the terminal a cell change order instructing the terminal to
switch over to a new cell (33, 43),
characterized in that if the new serving cell assigned to the terminal in the cell
change order is a cell the timing information of which is unknown to the terminal
10   after neighbour cell measurements, the cell change will not take place but the termi-
nal will send to the base station a cell change failure message (47) which includes
the cause of the cell change failure as well as neighbour cell information.

2.   The method according to claim 1, **characterized** in that the service network is
a GPRS network.

15   3.   The method according to claim 1, **characterized** in that the default operation
in the terminal is that it will not perform a cell change (34) to a cell the timing in-
formation of which is unknown to it.

4.   The method according to claim 2, **characterized** in that to the cell change
order PACKET_CELL_CHANGE_ORDER (43) an information element has been
20   added which gives the terminal a right not to perform the cell change if the terminal
does not know the timing information of the new cell assigned to it.

5.   The method according to claim 4, **characterized** in that said information
enabling the cancellation of the execution of the cell change order is transmitted in a
signalling message to the terminal in a GPRS service network at least partly in the
25   form of the following information elements:

<Packet Cell Change Order message content> ::=
            <**PAGE_MODE** : bit(2)
            {
            {0<**Global TFI** :Global TFI IE>>
30 |10<**TLLI**:bit (32)>}
            {0-Message escape
                {**IMMEDIATE_REL**:bit>
                <**ARFCN**: bit (10)
                <**BSIC**: bit (6)

<NC Measurement Parameters:<NC measurement Parameters struct>>
    Packet_cell_change_order_options: bit (3)>
      <padding bits>
|<Non-distribution part error: bit(*) = <no string>>}
|<message escape: 1 bit(*) = <no string>>}
|Address information part error: bit(*) = <no string>>}
|<Distribution part error: bit(*) = <no string>>;

6.   The method according to claim 5, **characterized** in that the bit combination "0-0-0"of the "Packet_cell_change_order_options" information element in said signalling message means that the terminal shall carry out the cell change order, and bit combinations "0-0-1", "0-1-0", "0-1-1", "1-0-0" and "1-1-1" allow the terminal not to carry out the cell change order if the terminal does not know the timing information of the new cell.

7.   The method according to claim 2, **characterized** in that the message (47) sent by the terminal to the base station, indicating the non-execution of the cell change, is a "Packet_cell_change_failure" message.

8.   The method according to claim 7, **characterized** in that said information sent by the terminal to the base station is transmitted to the base station in a GPRS service network in a signalling message (47) at least partly in the form of the following information elements:

<Packet Cell Change Failure message content> ::=
    <TLLI:bit (32)>}
    <ARFCN: bit (10)
    <BSIC: bit (6)
    <Neighbour_cell_reporting: <neighbour cell reporting struct>
    <spare padding>

9.   The method according to claim 8, **characterized** in that the "Neighbour_cell_reporting" information element in said signalling message comprises information about the number of neighbour cells the timing data of which are included in the measurement report as well as the neighbour cell measurement data in question.

10.   The method according to claim 9, **characterized** in that the measurement report comprises information only about those neighbour cells the timing informa-

tion of which has been learned from the neighbour cell measurements performed by the terminal.

11. The method according to claim 10, **characterized** in that in the measurement report sent by the terminal the neighbour cell measurement data include at least the ARFCN information representing the centre frequencies of the neighbour cells' BCCH channels.

12. The method according to claim 11, **characterized** in that the ARFCN information is replaced by an indexing system known in the cellular system.

13. The method according to claim 11 or 12, **characterized** in that the neighbour cell measurement data further include the neighbour cell identity information (BSIC).

14. The method according to claim 13, **characterized** in that the terminal arranges the neighbour cell measurement data in the measurement report in the order according to the reception level (RXLEV) measured by it for each neighbour cell.

15. The method according to claim 14, **characterized** in that the neighbour cell measurement data included in the measurement report further comprise the reception levels (RXLEV) in question.

16. A base station (BS, 551) in a cellular radio system, comprising means for providing a service (GSM, GPRS) and means for receiving signalling messages from a terminal (MS, 500) as well as means for generating signalling messages and sending them to terminals, **characterized** in that it further comprises means for receiving and processing information obtained from a terminal, which information is arranged so as to convey to the base station the data of those neighbour cells known to the terminal the timing information of which is known to the terminal.

17. The base station according to claim 16, **characterized** in that said service is the GPRS data packet transmission service.

18. The base station according to claim 16, **characterized** in that said signalling messages are signalling messages of the GPRS data packet transmission service.

19. A terminal (MS, 500) in a cellular radio system, equipped with means for connecting to a certain service (GSM, GPRS) and comprising means for receiving signalling messages from base stations (BS, 551) and means for performing cell specific measurements in order to find a suitable serving cell, **characterized** in that

it is further equipped with means for determining the timing information of neighbour cells and means for sending neighbour information to the base station of the current cell in the case that the timing information of the base station of the new cell assigned to the terminal in a cell change order by the serving base station is unknown to the terminal.

20. The terminal according to claim 19, **characterized** in that said certain service is the GPRS data packet transmission service.

21. The terminal according to claim 19, **characterized** in that said signalling messages are signalling messages of the GPRS data packet transmission service.

22. A cellular radio system comprising base stations (BS, 551) and associated cells (1-11) and terminals (MS, 500), in which system
- the base stations are equipped with means for conveying signalling messages between a base station and a terminal, and
- the terminals are adapted so as to operate at a certain service level (GSM, GPRS) and to convey signalling messages between a terminal and a base station,
characterized in that it further comprises information, which is known to a terminal, about a set of neighbour cells of said terminal, the timing information of the base stations of which neighbour cells the terminal has determined, whereby said system is adapted so as to convey, after a cell change order addressed to the terminal, said information in a signalling message from the terminal to a base station for the purpose of selecting a new serving cell if the target cell assigned to the terminal in the cell change order is not included in the set of neighbour cells determined by the terminal.

23. The cellular radio system according to claim 22, **characterized** in that said certain service is the GPRS data packet transmission service.

24. The cellular radio system according to claim 22, **characterized** in that said signalling messages are signalling messages of the GPRS data packet transmission service.